Unit 4 Quiz

Multiple Choice
Identify the letter of the choice that best completes the statement or answers the question.

____ 1. ____ bonds are created during the formation of the primary structure of a protein while ___ bonds are what hold together a protein's secondary structure.
   a. peptide; hydrogen
   b. peptide; disulfide
   c. hydrogen; peptide
   d. peptide;ionic

____ 2. The tertiary structure of a protein is the
   a. bonding together of several polypeptide chains by weak bonds.
   b. order in which amino acids are joined in a polypeptide chain.
   c. unique three-dimensional shape of the fully folded polypeptide.
   d. organization of a polypeptide chain into an á helix or â pleated sheet.

____ 3. What is the term used for a change in a protein's three-dimensional shape or conformation due to disruption of hydrogen bonds, disulfide bridges, or ionic bonds?
   a. hydrolysis
   b. stabilization
   c. destabilization
   d. renaturation
   e. denaturation

____ 4. Enzymes ___ the rate of reactions by decreasing ___.
   a. increase; free energy
   b. decrease; Ea
   c. decrease; substrates
   d. increase; Ea
   e. increase; substrates

____ 5. The active site of an enzyme is the region that
   a. binds allosteric regulators of the enzyme.
   b. is involved in the catalytic reaction of the enzyme.
   c. binds the products of the catalytic reaction.

____ 6. Increasing the substrate concentration in an enzymatic reaction could overcome which of the following?
   a. denaturization of the enzyme
   b. allosteric inhibition
   c. competitive inhibition
   d. saturation of the enzyme activity

Use the information below to answer question 7-8.

A series of enzymes catalyze the reaction X→Y→Z→A. Product A binds to the enzyme that converts X to Y at a position remote from its active site. This binding decreases the activity of the enzyme.

____ 7. What is substance X?
a. a coenzyme
b. an allosteric inhibitor
c. a substrate
d. the product

____ 8. Substance A functions as
a. a coenzyme.
b. an allosteric inhibitor.
c. the substrate.
d. a competitive inhibitor.

Refer to the following five terms to answer questions 9-11. Choose the most appropriate term for each phrase. Each term may be used once, more than once, or not at all.

A. lysosome
B. vacuole
C. smooth ER
D. Golgi apparatus
E. rough ER

____ 9. a compartment that often takes up much of the volume of a plant cell
a. A
b. B
c. C
d. D
e. E

____ 10. Which type of organelle is primarily involved in the synthesis of oils, phospholipids, and steroids?
a. A
b. B
c. C
d. D
e. E

____ 11. Which structure is the site of the synthesis of proteins that may be exported from the cell?
a. A
b. B
c. C
d. D
e. E

____ 12. Grana, thylakoids, and stroma are all components found in
a. vacuoles.
b. chloroplasts.
c. mitochondria.
d. lysosomes.

____ 13. In which community would organisms most likely have adaptations enabling them to respond to different photoperiods (varying hours of sunlight during the year)?
a. tropical forest
b. coral reef
c. savanna
d. temperate forest

____ 14. The growing season would generally be shortest in which of the following biomes?
a. savanna
b. taiga
c. temperate grassland
d. tropical rain forest

____ 15. A biologist reported that a sample of ocean water had 5 million diatoms of the species *Coscinodiscus centralis* per cubic meter. What was the biologist measuring?
a. density
b. dispersion
c. carrying capacity
d. quadrats
e. range

____ 16. Which of the following aspects of an organism's life is *least* relevant to its life history?
a. number of offspring per reproductive bout
b. age at which it first reproduces
c. frequency of reproduction
d. frequency of dispersal
e. all of the above

____ 17. A population of ground squirrels has an annual per capita birth rate of 0.06 and an annual per capita death rate of 0.02. Estimate the number of individuals added to (or lost from) a population of 1,000 individuals in one year.
a. 120 individuals added
b. 40 individuals added
c. 20 individuals added
d. 400 individuals added
e. 20 individuals lost

Use the following choices to answer questions 19-20.

A. $r\max N\frac{(K-N)}{K}$

B. $r\max N$

____ 18. Exponential growth of a population is represented by *dN/dt* =
a. A
b. B
c. C
d. D
e. E

____ 19. Logistic growth of a population is represented by dN/dt =
a. A
b. B
c. C
d. D
e. E

____ 20. As N approaches K for a certain population, which of the following is predicted by the logistic equation?
a. The growth rate will not change.
b. The growth rate will approach zero.
c. The population will show an Allee effect.
d. The population will increase exponentially.
e. The carrying capacity of the environment will increase.

____ 21. All of the following characteristics are typical of an *r*-selected population *except*
a. occurrence in variable environments.
b. high intrinsic rate of growth.
c. onset of reproduction at an early age.
d. extensive parental care of offspring.
e. occurrence in open habitats.

____ 22. Unlimited population growth is often prevented when death rates increase as population density increases. This is an example of
a. *K*-selection.
b. *r*-selection.
c. positive feedback.
d. negative feedback.

____ 23. Which of the following is an *incorrect* statement about the regulation of populations?
a. The logistic equation reflects the effect of density-dependent factors, which can ultimately stabilize populations around the carrying capacity.
b. Density-independent factors have an increasingly greater effect as a population's density increases.
c. High densities in a population may cause physiological changes that inhibit reproduction.
d. Because of the overlapping nature of population-regulating factors, it is often difficult to precisely determine their cause-and-effect relationships.
e. The occurrence of population cycles in some populations may be the result of crowding or lag times in the response to density-dependent factors.

____ 24. Root hairs are most important to a plant because they
a. anchor a plant in the soil.
b. store starches.
c. increase the surface area for absorption.
d. provide a habitat for nitrogen-fixing bacteria.
e. contain xylem tissue.

____ 25. Which of the following is responsible for the cohesion of water molecules?
   a. hydrogen bonds between the oxygen atoms of a water molecule and cellulose in a vessel cell
   b. covalent bonds between the hydrogen atoms of two adjacent water molecules
   c. hydrogen bonds between the oxygen atom of one water molecule and a hydrogen atom of another water molecule
   d. covalent bonds between the oxygen atom of one water molecule and a hydrogen atom of another water molecule
   e. Cohesion has nothing to do with the bonding but is the result of the tight packing of the water molecules in the xylem column.

____ 26. Water rises in plants primarily by the cohesion-tension model. Which of the following is *not* true about this model?
   a. Water loss (transpiration) is the driving force for water movement.
   b. The "tension" of this model represents the excitability of the xylem cells.
   c. Cohesion represents the tendency for water molecules to stick together by hydrogen bonds.
   d. The physical forces in the capillary-sized xylem cells make it easier to overcome gravity.

____ 27. Guard cells do which of the following?
   a. protect the endodermis
   b. accumulate K^+ and close the stomata
   c. contain chloroplasts that import K^+ directly into the cells
   d. guard against mineral loss through the stomata
   e. help balance the photosynthesis-transpiration compromise

____ 28. Ignoring all other factors, what kind of day would result in the fastest delivery of water and minerals to the leaves of a tree?
   a. cool, dry day
   b. warm, dry day
   c. warm, humid day
   d. cool, humid day
   e. very hot, dry, windy day

____ 29. Dwarf mistletoes are flowering plants that grow on certain forest trees. They obtain nutrients and water from the vascular tissues of the trees. The trees derive no known benefits from the dwarf mistletoes. Which of the following best describes the interactions between dwarf mistletoes and trees?
   a. mutualism
   b. parasitism
   c. commensalism
   d. facilitation
   e. competition

____ 30. Evidence shows that some grasses benefit from being grazed. Which of the following terms would best describe this plant-herbivore interaction?
   a. mutualism
   b. commensalism
   c. parasitism
   d. competition